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SERIAL NO.:	10/583,399	ART UNIT:	1793
FILING DATE:	November 29, 2004	DATE:	December 21, 2011
FOR:	Steel Wire for Cold Forging Having Excellent Low Temperature Impact Properties and Methods of Producing Same		

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REPLY BRIEF FOR APPELLANT

This is a reply to the Examiner's Answer mailed October 31, 2011.

I. Rejection under 35 USC § 112, first paragraph, of claims 5 and 6

The Examiner argues that the specification's reference to "hot rolled wire rod" in the Example at pages 11-12 means that the wire rod was plastically deformed while it was "quenched/tempered using a high frequency induction heater." This is incorrect, in that it ignores the description of the heat-treating process at page 5, lines 18-28 where no plastic deformation is described during heating of the steel.

The reference to "hot rolled wire rod" in the Example at pages 11-12 is to the fact that the starting material had previously been hot rolled, and not that it was

currently undergoing hot rolling while the described heating was taking place. Wire rod and other steel products that had previously been hot rolled are often subsequently described as such when they are used as the starting materials in other processes, such as the drawing that appellant describes in the Example. In the same way, appellant describes in the Example that he starts with wire rod that was originally hot rolled, but then describes the subsequent heating method of the present invention as being made with the use of a high frequency induction heater to raise the temperature to an Ac3 transformation point or higher.

Finally, induction heating causes all metals within the magnetic field to heat up. In order for there to be plastic deformation, the wire would have to be contacted by a metal roller or die during the heating to the Ac3 transformation temperature. This would not be practical (and perhaps impossible) if the metal roller or die apparatus were likewise being heated by the "high frequency induction heater" being employed. [1]

Thus, the Examiner has not demonstrated that one skilled in the art would understand appellant to be plastically deforming the steel during the induction heating of the steel to the Ac3 transformation temperature. Instead, appellant submits that one skilled in the art would understand the ordinary meaning that, if no plastic deformation is mentioned, the steel is not being plastically deformed during the recited induction heating step in claims 5 and 6.

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[1] The Ac3 temperature is over 700°C, and the steel would literally be red hot.

II. Rejection under 35 USC § 103 of claims 1-6

A. Method claim 3

The Examiner's argument regarding the teachings of appellant's own prior art Ahn reference is basically that there is some overlap in range generated by the claimed equation for tempering parameter "P." However, Ahn does not teach the other necessary parameter, that the austenitic grain size of the steel during the induction heating is limited to 5 – 20 μm. The prior art Ahn reference teaches a relatively unlimited austenitic grain size in the 5 – 90 μm range.

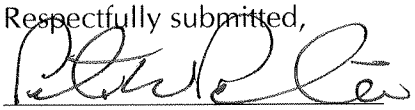
The Examiner then goes on to assert that "Appellant has not shown that the claimed method offers unexpectedly better results that the prior art." Answer, page 10. However, appellant has demonstrated the criticality of the claimed 5 – 20 μm austenitic grain size and other parameters during the induction heating, as set forth in Table 2 of the Example. Those comparative examples such as CO. EX. 7 that had a tempering parameter P of 27,990 within the claimed range, but an austenitic grain size of 35.0 μm outside the claimed range, did not meet the required high impact absorption energy of 60 J/cm^2 or more at –40°C. Likewise, those comparative examples such as CO. EX. 3 that had an austenitic grain size of 11.2 μm within the claimed range, but a tempering parameter P of 30,850 outside the claimed range, also did not meet the required high impact absorption energy. When compared to the comparative examples (CO. EX. 1-13), only those samples that had both the claimed grain size range and claimed tempering parameter P range had the necessary (and claimed) high impact absorption energy of 60 J/cm^2 or more at –40°C.

B. Article claim 1

Since claim 1 recites the same composition, austenitic grain size, tensile strength and impact absorption energy as method claim 3, appellant has likewise shown criticality and unexpected advantages over the Ahn reference.

Thus, in view of the unexpectedly better properties and advantages of the method and wire article of the present invention, there is simply no way one of ordinary skill in the art would consider it obvious to arrive at appellant's claimed invention from a reading of the prior art Ahn reference.

Respectfully submitted,



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